

REMARKS/ARGUMENTS

In the present Office Action, claims 1-11 were examined. Claims 1-11 are rejected, no claims are objected to, and no claims are allowed.

By this Amendment, claim 1 and 10 has been amended, no claims have been canceled, and claim 25 has been added. Accordingly, claims 1-11 and 25 are presented for further examination. No new matter has been added. By this Amendment, claims 1-11 and 25 are believed to be in condition for allowance.

A. Rejections Under 35 U.S.C. § 103(a)

The Examiner rejected claims 1-11 under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 4,605,532, issued to Knorr et al. (the '532 patent) in view of either Japanese Patent Application No. JP11-264037 or No. JP61-266540. As presently amended and explained further in the following remarks, claims 1-11 are believed to be patentable over the combination of the '532 patent and either of the Japanese references.

The present claimed invention is directed to a copper alloy having enhanced resistance to stress relaxation at elevated temperatures that is superior to other known copper alloys. The copper alloy of the present invention has a desired relief anneal temper formed using a particular relief annealing (RA) process (see the present specification at page 7, lines 14-17 and 19-21, page 9, lines 9-11, and page 11, lines 11-18), which contributes to the enhancement of the copper alloy's stress relaxation resisting characteristics (see claims 1 and 25). Specifically, one embodiment of the present invention was developed that includes a copper alloy having a relief anneal temper formed at a temperature of about 200°C to 350°C for about 30 minutes to 6 hours (see claim 1). In addition, another embodiment of the present was developed that includes a copper alloy having a relief anneal temper formed at a temperature of about 225°C to 325°C for about 1 to 3 hours (see claim 25).

Data in Table 3 of the present specification shows how a particular copper alloy formed using the RA process of the present invention has enhanced resistance to stress relaxation. A comparison of the "Percentage Stress Remaining-Long" values between copper alloys that were not relief annealed (designed as "F") and those that were relief annealed

(designated as “RA”) shows enhanced resistance to stress relaxation in each case where relief annealing was employed, e.g., H898-A-F vs. H898-A-RA, H899-A-F vs. H899-A-RA, and C-19500-F vs. C-19500-RA. In each of these side-by-side tests (with and without relief annealing), the alloys that were relief annealed were found to have a higher percentage stress remaining-long, which indicates that the copper alloys having a relief anneal temper according to the present invention have enhanced resistance to stress resistance.

The ‘532 patent teaches a copper base alloy that “may be stress relief annealed, if desired.” (see col. 6, lines 61-62) However, the ‘532 patent does not teach or suggest any conditions for annealing or making a product that has a relief annealing temper. Further, the ‘532 patent fails to recognize that a relief annealing temper helps achieve enhanced resistance to stress relaxation. Finally, none of the alloys disclosed in the ‘532 patent are taught to have a relief annealing temper or a relief annealing temper formed at a temperature of about 200°C to 350°C for about 30 minutes to 6 hours.

Japanese patent application No. JP11-264037 is directed to a copper alloy foil and Japanese patent application No. JP61-266540 teaches a copper-based alloy useful for semiconductor lead frames. Although directed to copper alloy materials, neither application teaches or suggests relief annealing and its relationship with enhanced resistance to stress relaxation. More importantly, neither application teaches or suggests a copper alloy that has achieved a relief annealing temper.

B. Summary

In summary, there is no teaching or suggestion in any of the three applied references, either alone or in combination, i.e., U.S. Patent No. 4,605,532, Japanese Patent Application No. JP11-264037, or Japanese Patent Application No. JP61-266540, to motivate one skilled in the art to prepare the copper alloys of the present invention with a relief annealing temper formed at a temperature of about 200°C to 350°C for about 30 minutes to 6 hours so as to achieve the desired property of enhanced resistance to stress relaxation. Therefore, the Applicant submits that as amended, claim 1 is not obvious over the ‘532 patent in view of either Japanese Patent Application No. JP11-264037 or Japanese Patent Application No.

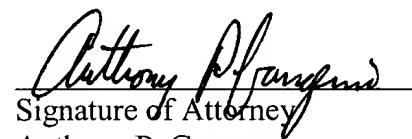
JP61-266540. In addition, because they depend from amended claim 1, for at least the same reasons amended claim 1 is believed to be in condition for allowance, existing claims 2-11 and new claim 25 are also believed to be in condition for allowance.

Accordingly, Applicant submits that none of the references, alone or in combination, anticipate or make obvious the invention as presently claimed and that the application is now in condition for allowance. Therefore, Applicant respectfully requests reconsideration and further examination of the application and the Examiner is respectfully requested to take such proper actions so that a patent will issue herefrom as soon as possible.

If the Examiner has any questions or believes that a discussion with Applicant's attorney would expedite prosecution, the Examiner is invited and encouraged to contact the undersigned at the telephone number below.

Please apply any credits or charge any deficiencies to our Deposit Account No. 23-1665.

Respectfully submitted,
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